DOCUMENT RESUME

ED 175 180 EC 115 170

AUTHOR Rodabaugh, Barbara J.; Hall, Amanda P.
TITLE Development of a Preparatory Reading Program for Visually Handicapped Children. Final Report.
INSTITUTION American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
REPORT NO AIR-60200-7/78-FR
PUB DATE Jul 78
GRANT G007604406
NOTE 75p.; Print is marginal and may not reproduce well in hard copy; For related information, see EC 115 170-172

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Basic Reading; Demonstration Projects; Exceptional Child Research; *Multisensory Learning; Program Effectiveness; *Reading Instruction; *Reading Programs; *Reading Readiness; *Visually Handicapped

ABSTRACT

A pre-reading program for visually handicapped children who are potential braille or large print readers was developed and field tested with 20 students and 11 teachers. The program was designed to teach basic reading readiness concepts at the preschool, kindergarten, or primary grade level. Instructional objectives were developed for each of ten concept areas, and structured, multisensory lessons were written to teach the objectives. Field test data indicated that the program is a viable tool in terms of student and teacher time, direct costs, ease of use, appropriateness of the concepts taught, and student interest. Teachers were positive in their overall ratings of the program's usefulness and recommended it not only for visually handicapped children, but also for nonhandicapped preschool, disadvantaged kindergarten, learning disabled, and mentally retarded children. (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED175180

AIR-60200-7/78-FR

DEVELOPMENT OF A PREPARATORY READING PROGRAM FOR VISUALLY HANDICAPPED CHILDREN

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Grant No. G007604406

Final Report

Barbara J. Rodabaugh
Amanda P. Hall

Submitted to

Bureau of Education for the Handicapped
U. S. Office of Education
Washington, D.C.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Barbara Rodabaugh

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

July 1978

E011570

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Grantees undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

ABSTRACT

The Development of a Preparatory Reading Program for Visually Handicapped Children

The goal of this project was to develop and field test a pre-reading program for visually handicapped children who are potential braille or large print readers. The program was designed to teach basic reading readiness concepts to visually handicapped children at a preschool, kindergarten, or primary grade level in preparation for formal reading programs.

Based on a review of the literature and other reading readiness programs, ten concept areas were identified which were considered to be most directly related to the reading process. Instructional objectives were developed for each concept area and structured, multisensory lessons were written to teach the objectives. The entire program is organized into ten units, each of which contains a pretest, suggested experiential activities, guided teaching/learning exercises, and a posttest. Each unit is accompanied by a storybook, written in large print and braille with raised-line drawings, to dramatize the concepts in the unit. The storybooks also contain questions designed to stimulate the child's reasoning and reading comprehension skills.

As the program was developed it was reviewed by consultants to the project and pilot tested with children who were representative of the target population. The materials were field tested at school sites in four states during the 1978-79 school year. Twenty children at various developmental levels and eleven teachers participated in the field test. Evaluative data were collected by means of progress logs submitted by teachers during the course of the field test and from interviews conducted with teachers at the conclusion of the school year.

These data indicated that the program is a viable reading readiness tool for visually handicapped children in terms of student and teacher time, direct costs, ease of use, appropriateness of the concepts taught, and student interest. Teachers were positive in their overall ratings of the usefulness of the program and would recommend it not only for children with severe vision deficits, but also for non-handicapped preschool children, disadvantaged kindergarten children, and children with learning problems related to learning disability or mental retardation.

Results of the field test indicated there is a need for empirical research to determine the optimum sequence in which basic concepts should be taught to visually impaired children. Recommendations for improving the program were that it be expanded to include additional conceptual areas and that a kit be developed which contains all of the materials needed for teaching the lessons. It was concluded that the program does fill an unmet need for certain children at a pre-reading level, and that the program is worthy of publication and dissemination.

ACKNOWLEDGEMENTS

This project could not have been completed without the special help of some special people.

Valuable input and support was given throughout the development of the PREP materials by three consultants to the project:

Dr. Philip Hatlen, San Francisco State University;

Dr. Dorothy Lloyd, San Francisco State University; and

Dr. Robert Weisgerber, American Institutes for Research.

Jane Corcoran was dedicated and creative in producing the raised-line drawings and preparing the braille and large print versions of the PREP stories.

Alain Zulofsky, Susan Lalush, and Fred Green, teachers of the visually handicapped in the Jefferson Elementary, Campbell Union Elementary, and San Jose Unified school districts, tried the preliminary PREP lessons with children in their resource and itinerant programs.

Nancy Akeson and Sharon McCarthy of the Variety Club Blind Babies Foundation were extremely helpful in locating children for the pilot testing of the lessons.

Mr. and Mrs. Russell Hurst, parents of Chuckie, and Mrs. Susie Gunn, mother of Patrice, welcomed AIR staff members into their homes for the purpose of pilot testing the lessons. Chuckie and Patrice were very important contributors to the project.

The volunteer efforts of the Sixth District California State PTA Braille Transcription Project made possible the reproduction of the storybooks in quantity.

We are indebted to the school personnel who participated in the field trials of the draft materials:

Cincinnati Public Schools/Cincinnati, Ohio

Mary Pinkelton

Judy Hornsby

Carol Rhyner

Hillsborough County Public Schools/Tampa, Florida

Paul Rich

Laura Cooper

Maureen Gorman

Jan Pullen

Jeanne Smith

Regional Service Agency/Skokie, Illinois

Naomi Hirschman

Judith Masters

Jodi Sticken

Chris Schumacher

Santa Clara County Schools/Santa Clara, California

Charles Wrieden

Mary Silvas

San Mateo County Schools/San Mateo, California

Robert Dodge

Susan Pokart

Sandra Salmons

Mary Ann Sklar

Several additional AIR staff members made valuable contributions to the project. Don Reed and Annatta Blackmarr were extremely helpful and capable in the preparation of the PREP materials for printing. Leonard Lutomski developed the design for the lesson presentations and helped in the materials preparation. Finally, our deep appreciation to Angelica Hampel for her commitment to the project and her dedicated work in seeing the final product into print.

Barbara Rodabaugh

Amanda Hall

TABLE OF CONTENTS

ABSTRACT

ACKNOWLEDGEMENTS

I. INTRODUCTION 1

II. METHODS 5

A. Materials Development 5

B. Field Test 11

III. RESULTS 17

A. Progress Log Data 17

B. Teacher Interview Data 25

IV. CONCLUSIONS 37

V. RECOMMENDATIONS 39

VI. REFERENCES 41

VII. APPENDIXES

Appendix A - Readiness Programs

Appendix B - Concepts Taught in the PREP

Appendix C - Conceptual Areas and Instructional Objectives for the PREP

Appendix D - Lesson Format

Appendix E - Data Collection Instruments

List of Tables

Table No.		Page
1	Field Test Sample.	12
2	Characteristics of Students Participating in the Field Test	13
3	Number of Students Attempting Each PREP Lesson (Total N=20)	16
4	Children's Concept Mastery as Indicated by Pretest	18
5	Difficulty Level: Lessons	21
6	Difficulty Level: Stories	21
7	Student Response	21
8	Individual Student Progress	22
9	Time Requirements for Teacher Preparation and Instruction	26
10	Strengths of the PREP.	27
11	Weaknesses of the PREP	28
12	Appropriateness of PREP for Children with Other Handicaps.	30
13	Teachers' Overall Evaluation of the PREP . . .	33
14	Other Student Benefits from the PREP	34

List of Figures

Figure No.		Page
1	Design of the Preparatory Reading Program for Visually Handicapped Children. . .	9

I. INTRODUCTION

The purpose of this research study was to produce an instructional program to help teachers prepare visually handicapped children for the process of learning to read braille or large print. The project, funded by the Bureau of Education for the Handicapped, was designed to fill a major gap in existing educational programs by providing a systematic way of teaching blind and low vision children some of the major concepts that are fundamental for reading readiness. Both the rationale behind the program and the instructional strategies it employs were based on the special cognitive needs of visually handicapped children.

By the time they enter school, children with severe visual handicaps are often developmentally behind their sighted peers. Furthermore, this developmental lag is most apt to be in those areas that are the foundations for learning to read--language development, perceptual abilities, and breadth of experience. According to Nolan and Kederis (1969), "Growth of factors basic to reading readiness...occurs more slowly with blind children, and basic growth in these areas may still be underway in the upper elementary grades" (p. 43). Thus, visually handicapped children not only start behind their sighted peers, but often stay behind as they progress through the educational system.

It has been estimated by the American Foundation for the Blind (Goldish, 1973) that there are approximately 20,000 preschool children with severe vision handicaps in this country. Without reading readiness programs which are geared to their special needs and abilities, most if not all of these children will begin their formal reading programs at an extreme disadvantage to their sighted peers. Such programs have not been commercially available, and many classroom teachers have found it necessary to develop new materials or adapt those designed for children with normal vision who are at normal developmental levels. These materials have been costly in terms of teacher time and effort, and the results have not always been appropriate or effective.

The general goal of this project was to help visually handicapped children be prepared for a better start in school by making available a program based on a structured, multisensory approach to concept development. This program--the Preparatory Reading Program for Visually Handicapped Children

(PREP)--incorporates certain hypotheses about the special learning abilities and styles of blind and low vision children:

1. The developmental lag which characterizes most visually handicapped children is primarily the result of their limited experience and perception rather than any intellectual deficit.
2. Many concepts learned casually during the daily course of events by sighted children must be specifically taught to the visually handicapped child.
3. Visually handicapped children function primarily on a concrete and functional conceptual level.
4. Action learning is a vital component in the cognitive development of visually handicapped children.
5. Visually handicapped children often lack a unified sense of their environment which is necessary for reading comprehension; this deficit is best remediated through utilization of all perceptual modes, including tactile, auditory, and kinesthetic.

The specific objectives of the project were as follows:

- To develop sensory and perceptual exercises that utilize all the modalities available to the visually handicapped child
- To present concepts in the context of sensory and perceptual exercises that are geared to the needs and understanding of the visually handicapped child
- To develop reading materials that correspond to the experiences and concepts presented during the sensory and perceptual exercises
- To organize these materials into a structured reading readiness program
- To field test the materials in four states throughout the country
- To evaluate the materials after implementation

This report describes the development of the PREP over a two-year period, including the selection of basic concepts to be taught, the preparation of the instructional package, and the field testing of the materials

by teachers and students in selected school districts. The final sections summarize the evaluative data collected and offer recommendations for future research.

II. METHODS

The project was conducted in two phases. During Phase I, the first year of the contract, instructional objectives were defined and materials were developed. During Phase II, the 1977-78 school year, the program was field tested at selected school sites, and data were collected about the general effectiveness of the approach.

A. Materials Development

Selection of Concepts and Learning Objectives

First, a review of the literature that included over fifty references was conducted as a preliminary step to determine the selection of concepts to be taught in the program. Articles pertaining to the visually handicapped and the sighted were covered in the review. Ten readiness programs (nine for the sighted, one for the visually impaired) were reviewed in depth to ascertain those concepts that were emphasized as necessary for reading. (These programs are listed in Appendix A.)

Nearly 200 concepts were found in all the reading readiness programs that were reviewed. Only those concepts that were directly related to the reading process were incorporated into the conceptual areas for the PREP. Concepts related to the understanding of the subject matter of reading materials (such as "happy" or "morning") were eliminated on the basis that they were not directly necessary for the performance of a prereading or reading skill. From the literature, it became evident that there are many kinds of readinesses for reading. It was decided that the PREP would focus on conceptual skills which are generally thought to contribute to an understanding of the reading process. Originally, thirty-two of the most frequently mentioned and most applicable areas were selected to be taught, and specific instructional objectives were written for each concept area. The objectives then were grouped into units, with two to three lessons in each unit.

Each lesson in the program was designed to include:

1. A Pretest which would determine the extent of the child's knowledge of the specific concepts to be taught

2. Experiential Exercises to introduce and reinforce the lesson's concepts

3. Guided Presentations or structured teaching/learning activities designed to teach the specific objectives of the lesson

4. A Posttest to indicate the child's mastery of the concept or the need for more instruction

It was planned also that every unit would be accompanied by a storybook, written in large print and braille with raised-line drawings, to dramatize the concepts in the unit.

A lesson format was then developed for the program according to the following specifications:

- ease and clarity of administration
- appropriate use of language
- immediate feedback and reinforcement for the student
- teacher modeling of desired behaviors
- built-in variations to meet the needs of individual children
- sequence of simple to more complex conceptual tasks
- generalized applications of learned concepts

Consultant Review of Objectives

As the next major step in the development of the materials, the selected concepts and a sample lesson format were reviewed by three consultants to the project:

Dr. Philip Hatlen, San Francisco State University, nationally prominent leader in the training of teachers of the blind and co-author of the text Blind Children Learn to Read;

Dr. Dorothy Lloyd, San Francisco State University, specialist in reading, early childhood education, and teacher education;

Dr. Robert Weisgerber, American Institutes for Research, director of several research studies to improve the education and living skills of visually handicapped children and adults.

The following decisions were made as a result of the review process:

1. The number of units in the program should be limited to ten, and each unit should be limited to two lessons. (Appendix B shows the final course outline agreed upon.)

2. Each lesson should be limited to three teaching/learning objectives, with suggestions to the teacher for further instruction if required. (Appendix C is a list of the objectives selected for each lesson.)

3. The format of the lessons should clearly facilitate the administration of the exercises, by indicating to the teacher what should be said and done. (Appendix D is an example of the lesson format.)

4. The Experiential Exercises should be written to allow teacher flexibility in the use of an inductive or deductive approach to the material, and should utilize materials with a functional meaning for the visually impaired child.

5. Each story should be accompanied by a list of questions with affective content which cause the child to think about the story.

Development and Pilot Testing of the Materials

Instructional materials and a Teachers' Guide were next prepared according to the guidelines established by project staff members and the three consultants. As draft versions of the lessons and stories were completed, they were reviewed by the project consultants and pilot tested with a small number of visually handicapped children at the pre-reading level. The purpose of the pilot test was to determine the appropriateness of the vocabulary level and the clarity of the instructions in the lesson, as well as to identify any problems the children might have in doing the prescribed activities.

The major criterion for selecting children to participate in the pilot testing was that these children should be representative of the target population for the pre-reading program--that is, they should be (a) of normal intelligence, (b) severely visually handicapped, and (c) at a pre-reading level developmentally (from 4 to 6 years of age). In all, a total

of four children were identified within the immediate geographical area who appeared to fit the criteria, and at least part of the program was tried out with all four children. All of the lessons were tried out with (a) a 4-year old boy of above average ability and with low vision and (b) a 5 1/2-year old girl who is totally blind. Both children had been enrolled in pre-school programs; the boy was ready for kindergarten placement, and the girl was ready for first grade placement. Tryouts indicated that the materials were appropriate, understandable, and enjoyable for both children.

Some minor revisions were made in the materials on the basis of the pilot testing and the consultant review. Then the final version of the entire program was prepared for tryout in the field.

Description of the Program

Figure 1 shows the overall design of the finished program. A complete set of the PREP consists of ten instructional units, ten separately-bound storybooks, and a Teacher's Guide. This Guide, included as an introductory section of the instructional manual, describes the program's structure and the general procedures for administering the lessons. Within each lesson, there are more specific instructions for the teacher in guiding the child through the learning exercises. A major goal during the development of the lessons was to make them as complete and easy to administer as possible so that extensive teacher training or preparation time would not be necessary.

Variations in the instructional sequence to meet the needs of individual children have been built into every lesson. Instructional strategies used in the PREP systematically guide students through a broad range of concrete multisensory experiences. Most of the exercises involve the manipulation of meaningful objects that teachers can easily obtain, rather than models of objects, on the assumption that exposure to commonly-used materials would greatly enrich the child's experience base. A list of suggested items needed for each exercise is printed at the beginning of every lesson. Every effort has been made to keep the materials simple, inexpensive, and easy to get. Teachers may substitute items for those listed, provided that the substituted items are appropriate for the exercise.

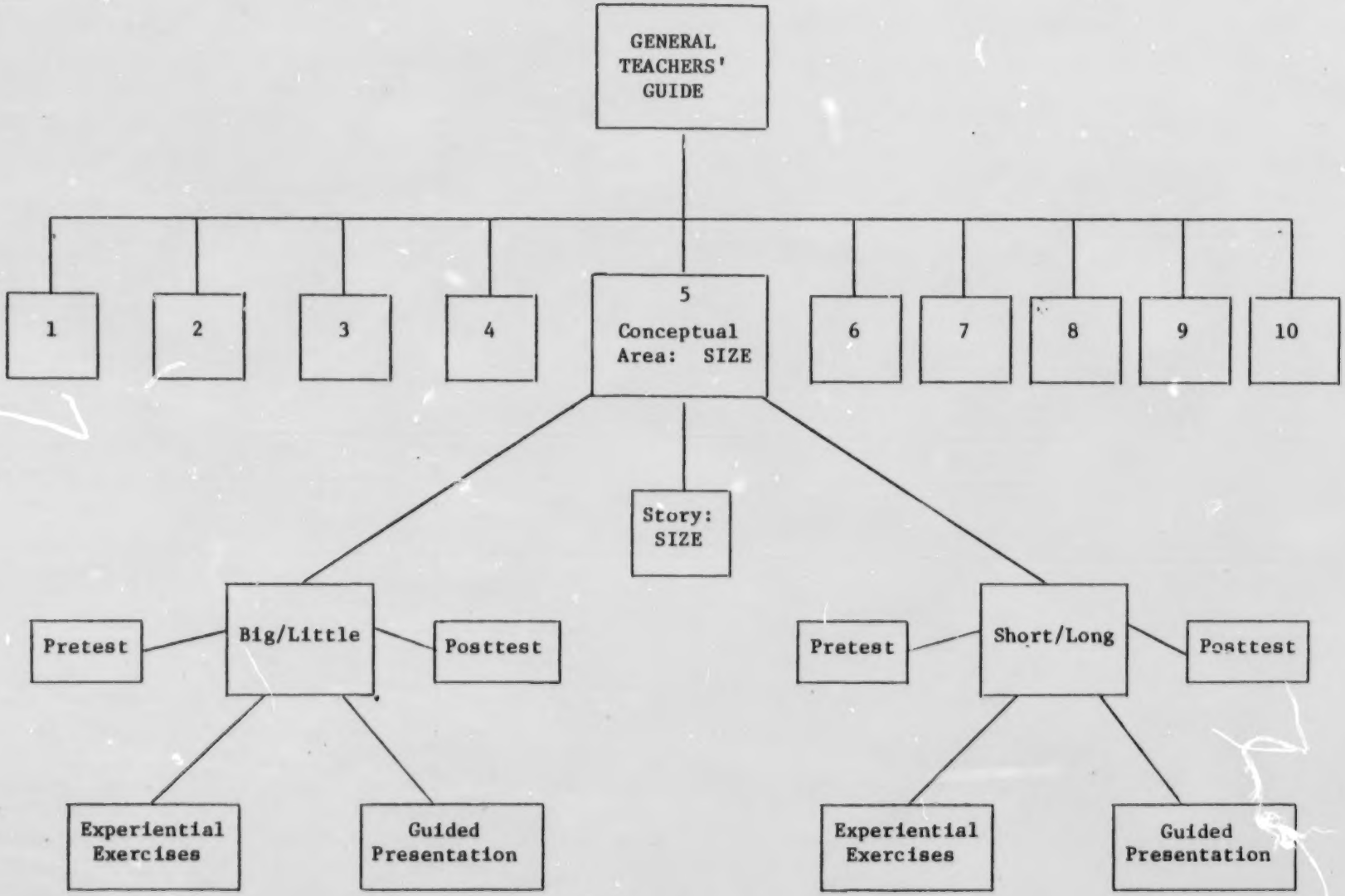


Figure 1. Design of the Preparatory Reading Program for Visually Handicapped Children.

The stories in the PREP, printed in braille and large type, provide visually handicapped children with opportunities to develop an awareness of the relationship between the written word and spoken language. The intent is that these children should be exposed to the same kinds of pre-reading experiences that sighted children have when their parents read to them. That is, as the child listens to the story, he or she also has the opportunity of looking at the large print and/or feeling the braille dots, thereby associating the printed page with spoken words and their meanings. The stories also have raised-line drawings to increase the child's interest and involvement. These drawings primarily depict two-dimensional figures that are easy for the child to interpret. Each story has a series of questions that the teacher or parent can use to discuss the story, including its affective content.

Procedures for Using the Program

General steps in the instructional sequence for each lesson are as follows:

Step 1: A Pretest is administered to determine the child's knowledge of the specific concept to be taught. Depending on the child's performance, instruction may begin at one of three points in the lesson, which is designed to be increasingly difficult and to move the child from a concrete to a more abstract understanding of the concept. If the child shows mastery of the concept by correctly answering all of the pretest items, the teacher may choose to go on to the next lesson or may decide that the child will benefit from some of the experiences provided in the lesson. (Appendix E is an example of pretest items.)

Step 2: The teacher makes selective use of the Experiential Exercises, either to introduce the child to the concept or to reinforce the child's understanding of it. These exercises consist of games and other activities which are meant to be fun and at the same time serve a learning purpose. The teacher is free to select from among the various exercises, depending upon the materials on hand as well as the needs, interests, and abilities of the child.

Step 3: The Guided Presentations are introduced. Within each lesson there are three Guided Presentations, each of which covers a well-defined learning objective. For each objective, three or four structured teaching/

learning exercises are provided. These exercises give the teacher step-by-step procedures for involving the child in concrete, and usually multi-sensory, learning experiences. In most cases the exercises are sequenced so that concepts are demonstrated first through body awareness activities and then through the manipulation of objects. For some lessons, the exercises lead to more abstract levels of thinking. Each Guided Presentation requires about 20 minutes to complete. An entire lesson can be covered in 60 minutes with a child of average ability.

Step 4: The teacher reviews with the child the Experiential Exercises and specific exercises in the Guided Presentations, as needed. The last one or two exercises in each Guided Presentation are designed to serve as the criterion test for that segment of the lesson. If indicated by the criterion test, the teacher has the child repeat a particular exercise or spends some additional time on the Experiential Exercises.

Step 5: The Posttest is administered to determine whether the child has internalized the specific concept taught. The results help the teacher decide whether the child should have further review or is ready to move on to the next unit in the program.

Step 6: The storybook is presented to the child after both lessons in the unit have been reasonably mastered. Questions accompanying each story are discussed with the child in order to review the content as well as relate the events and feelings depicted in the story to the child's unique life experience. Teachers are encouraged to send the storybooks home with the child so that parents may be actively involved in the program.

B. Field Test

Selection of Field Test Sites

During the 1977-78 school year, the final version of the program was field tested for the purpose of collecting evaluative data on the PREP's usefulness in a variety of settings and with children of varying degrees of handicap.

Field test sites in four states had been arranged at the outset of the project, and these sites were regularly kept up-to-date during the first

year about the progress of the materials development. However, the enrollment of visually handicapped pupils who fit the specifications of the study dropped below the expected number in one of the states during the fall of 1977. As a consequence, this state was not able to participate in the study. During the summer prior to the start of the field trials, another state which previously had expressed interest in the program was invited to participate. The final field test sample, including the number of teachers and students in each state, is shown in Table 1.

TABLE 1

Field Test Sample

State	Number of Teachers		Number of Students	
	Completed Tryouts	Withdrew From Tryouts	Completed Tryouts	Withdrew From Tryouts
California	3	1	3	3
Ohio	1	1	3	3
Illinois	3	0	7	0
Florida	4	0	7	2
TOTAL	11 teachers	2 teachers	20 students	8 students

Eleven teachers and 20 students from four states completed the field test of the PREP. Two teachers had to withdraw from the tryouts because of heavy class loads. These teachers accounted for six of the students who did not complete the program. One child was dropped from the study because he was no longer eligible to receive services from the district's program for the visually impaired. Another child dropped out of the study for unexplained reasons.

The sites were chosen because preliminary inquiries had indicated that they had a sufficiently large population of visually handicapped children who were of normal intelligence and at a pre-reading level. However, in contacts with the schools in the summer and fall of 1977, it was found that a large proportion of these children was of lower than average intelligence. It was decided that lower functioning children would be

eligible to participate in the field test if, in the judgment of school personnel, they might benefit from the program. The decision was based on the rationale that such children are a part of the target population for a pre-reading program, and the PREP should be evaluated in relation to the learning needs of these children as well as children of normal intelligence. Characteristics of the students in the field test sample are shown in Table 2.

Field Test Procedures

Early in the fall of 1977, the associate project director met with teachers at each of the field sites to introduce the instructional materials and to conduct training sessions in their use. At the same time, teachers were asked to complete a brief checklist providing background information about students who were in the study. Directions for completing progress logs at the end of each lesson were also given to the teachers, along with the request to send the logs to AIR on an ongoing basis throughout the year. These logs were used to record information about the amount of time required to work through each unit with an individual child, the appropriateness and adequacy of the learning exercises, and the level of student interest in the materials. Teachers were also asked to include anecdotal comments and any suggestions for improvements in the program.

Teachers were expected to begin administering the PREP as soon as possible after the site visit. They were free to develop their own daily schedules for teaching the lessons, but were encouraged to complete one unit in about one week's time. They were also urged to foster the participation of parents in reading the storybooks to their children at home.

During the field test, a number of telephone and mail inquiries were made by project staff to check on teacher progress and to help with any problems they might have encountered with the materials. In addition, the progress logs were monitored by project staff members as they were received. If the logs contained missing or contradictory data, they were returned to teachers with a request for clarification.

It had been expected that each lesson would require approximately one week to administer. However, the rate of return of progress log data indicated that the lessons were going more slowly than expected at most of the test sites. Part of this delay was caused by bad weather which closed

TABLE 2

CHARACTERISTICS OF STUDENTS PARTICIPATING IN FIELD TEST

Grade Equivalent:	pre K	K	1	TMR[a]/EMR[b] Ungraded
N=	9	6	1	4*

Age:	3	4	5	6	7	8	9	10	11
N=	1	5	7	3	1	1	0	1	1

Sex:	Male	Female
N=	8	12

Vision:	Totally Blind	Low Vision
N=	2	18

Potential Reading Medium:	Braille	Large Print
N=	2	18

Age of Onset of Vision Loss:	Birth	< 3 Months
N=	19	1

Additional Handicaps:	None	One or More
N=	10	10

Type of VH[c] Program:	Itinerant	Resource Room	Self-Contained Classroom
N=	14	3	3

[a] Trainable Mentally Retarded
[b] Educable Mentally Retarded
[c] Visually Handicapped
*These four students were ages 6, 8, 10, and 11 but classified as being developmentally at a pre-reading level by their school districts.

schools at several sites and which led to high student absentee rates in the schools that remained open.

The major reason for slow lesson progress, however, was the limited time teachers could devote to the program due to other instructional demands. Also, many of the districts were requiring teachers to write individualized educational plans (IEPs) for the first time in compliance with Public Law 94-142. The IEP process was new to several of the teachers and much of their time was spent in learning to initially evaluate students, to regularly assess their progress, and to write instructional plans. Despite these problems, half of the students completed the entire program, and 85% progressed as far as Unit VI. Table 3 indicates the number of students exposed to each lesson as determined from progress log data. (Numbers and percentages on this table are not strictly linear because a progress log for one student who took Unit I was never submitted, and one student began the program at Unit V.)

Toward the end of the field test period, a second site visit to all participating districts was made by the associate project director. During these meetings, interviews were conducted individually with teachers to obtain their evaluative comments about the program, including their judgment of the need for the program, the extent to which the program meets that need, and the quality and usefulness of the materials as a reading readiness tool. The results of these interviews, along with an analysis of progress log data, are presented in the following section. Appendix F contains copies of all the assessment instruments.

TABLE 3

NUMBER OF STUDENTS ATTEMPTING EACH PREP LESSON (Total N= 20)

	N	Percent
UNIT I		
Lesson 1	18	90%
lesson 2	18	90%
UNIT II		
Lesson 1	19	95%
Lesson 2	19	95%
UNIT III		
Lesson 1	19	95%
Lesson 2	19	95%
Unit IV		
Lesson 1	17	85%
Lesson 2	17	85%
UNIT V		
Lesson 1	18	90%
Lesson 2	18	90%
UNIT VI		
Lesson 1	17	85%
Lesson 2	17	85%
UNIT VII		
Lesson 1	15	75%
Lesson 2	14	70%
UNIT VIII		
Lesson 1	14	70%
Lesson 2	14	70%
Unit IX		
Lesson 1	12	60%
Lesson 2	12	60%
Unit X		
Lesson 1	11	55%
Lesson 2	10	50%

III. RESULTS

The information collected throughout the project was designed to provide data about the strengths and weaknesses in the PREP in order to make specific improvements in the program. Although an attempt was made to gauge the effects of the PREP on student learning within the constraints of the study, the discussion which follows is based on formative rather than summative data and is focused on the program itself rather than student achievement.

A. Progress Log Data

Student Entry Levels

The pretest for each lesson was designed to indicate the student's relative entry-level mastery of the particular concept taught in that lesson. Depending on the results of the test, the student might begin the lesson with the first, second, or third Guided Presentation, corresponding to the first, second, or third objective of the lesson. If the child exhibited mastery of the concept, the teacher could decide to teach the lesson to give the child additional practice and experience with the concept, or could choose to go on to the next lesson. In many cases, teachers did try out the lessons and provide ratings on them even though pretest results showed that a child already understood the concept.

Several teachers commented that they felt the pretests were too easy or too short to be a good indication of the child's internalization of the concepts. In other words, teachers were not always confident that mastery on the pretest was a valid measure of the child's mastery of the concept. Therefore, additional items have been added in the final revised version of the program to ensure that the tests more adequately reflect a child's level of conceptual understanding.

Despite the fact that they appeared to be too easy, the pretests did discriminate as shown by Table 4.

The sequence of lessons in the program had been chosen on the basis of the presumed hierarchical order of the concepts in terms of children's

TABLE 4

CHILDREN'S CONCEPT MASTERY AS INDICATED BY PRETEST

Concept	% of Children Showing Mastery *	No. of Children Given Pretest	No. of Children Showing Mastery	Unit/Lesson
Up/Down	100%	16	16	VI-1
Over/Under	94	16	15	VI-2
Patterning	92	12	11	IX-1
Sorting	91	11	10	X-1
Top/Bottom	89	18	16	V-2
First/Last	86	14	12	VIII-2
Same/Different	86	14	12	VII-1
Circle	84	19	16	III-2
Square	83	18	15	III-1
Start/Stop	82	17	14	IV-1
Slow/Fast	80	15	12	IV-2
Sound/Action Match	72	18	13	I-2
Selecting	70	10	7	X-2
Long/Short	68	19	13	II-2
Big/Little	63	19	12	II-1
Left/Right	61	18	11	V-1
Part/Whole	60	15	9	VII-1
Sequencing	58	12	7	IX-2
Before/After	50	14	7	VIII-1
Sound/Object Match	39	18	7	I-1

*Based on number of children taking each pretest.

cognitive development. For the most part, lessons progressed from a concrete to a more abstract level of reasoning. However, the difficulty level of the concepts as measured by the children's performance on the pretests did not match the lesson sequence. All of the children, for example, showed an understanding of "up" and "down" presented in Unit VI, and more than 90 per cent of the children understood the concept of "patterning" taught in Unit IX. On the other hand, the first concept in the program--the matching of sounds and objects--was understood by less than half the children who took the pretest.

Teachers' comments did not indicate any major differences in the difficulty level of the pretest items themselves. Therefore, these results might be interpreted in several ways: (a) the pretests were not accurate measures of conceptual understanding; (b) the lesson sequence was not organized in an accurate hierarchical sequence; or (c) visually handicapped children do not learn concepts in the same developmental sequence as do children with normal vision. Although the results shown in Table 4 raise some interesting questions, it was not possible to investigate them further in this study, nor was it possible to do a major restructuring of the lesson sequence. However, the order of the lessons within three of the units were reversed on the basis of test results and teacher suggestions. These lessons were in Unit V on Positions, Unit VII on Relationships, and Unit VIII on Time.

Pretest scores for individual children were examined to find out whether age or general intellectual functioning seemed to be related to knowledge of concepts. There were no clear relationships. None of the children showed mastery on the pretests of all 20 concept areas. Two children had mastery of 19 out of the 20 concepts, and both of these children were at the prekindergarten level. Two children did not understand any of the concepts on which they were pretested. One of these children was characterized by her teacher as having poor language development; the other child was mildly retarded. On the other hand, an 8-year old child with a WISC verbal score of 72 showed mastery of 9 of the 12 concept areas in which she was pretested.

Teacher Ratings of Lessons and Stories

As a teacher completed each lesson with an individual child, she was asked to rate it in terms of its difficulty and interest for that student. These ratings are summarized in Tables 5, 6, and 7. (The variability in the number of ratings reflects differences in the number of lessons completed by each student.) Generally, the difficulty levels of the lessons in terms of the objectives, learning exercises, and length were judged to be appropriate about two-thirds of the time, and too easy about one-third of the time. Only rarely was a lesson considered too difficult for a particular child. The vocabulary level was rated "about right" in almost every case.

The difficulty level of the stories was rated appropriate for nearly every child. The questions which accompanied the stories, which teachers used to stimulate the child's thinking about their content and meaning, proved to be too difficult for a large number of the children. However, several teachers commented that they felt the questions were a valuable aid to reading comprehension even when they were hard for a child to answer.

Overall, student interest in and mastery of the lessons and stories was average to excellent.

Student Progress

Ten of the students completed all of the lessons, and all but three students completed at least six units. Two of the students showing the slowest progress had below normal scores on aptitude tests, and the third child was retarded in her language development, according to her teacher. Student progress, along with characteristics of the students and comments of teachers, are shown in Table 8. Aptitude scores were not available for the majority of the students in the field test. However, a number of children with physical problems in addition to their visual impairment, as well as emotional and learning problems, did complete the program.

Instruction and Teacher Preparation Time

An important part of the evaluation of any instructional program is the amount of time it requires for teacher preparation and the amount of instructional time it consumes. Unfortunately, these data were not always recorded by teachers on the progress logs. The limited data that were

TABLE 5

DIFFICULTY LEVEL: Lessons

	No. of Ratings	Too Hard	Too Easy	About Right
Objectives	184	6 (3%)	67 (37%)	111 (60%)
Exercises	179	6 (3%)	69 (39%)	104 (58%)
Length	177	5 (3%)	50 (28%)	122 (69%)
Vocabulary	180	3 (2%)	8 (4%)	169 (94%)

TABLE 6

DIFFICULTY LEVEL: Stories

	No. of Ratings	Too Hard	Too Easy	About Right
Content	146	10 (7%)	1 (1%)	135 (92%)
Raised-Line Drawings	140	10 (7%)	3 (2%)	127 (91%)
Questions	146	63 (43%)	2 (1%)	81 (56%)

TABLE 7

STUDENT RESPONSE

	No. of Ratings	Excellent	Average	Poor
Interest Level: Exercises	150	82 (55%)	53 (35%)	15 (10%)
Interest Level: Stories	136	79 (58%)	51 (38%)	6 (4%)
Mastery of Unit	227	140 (62%)	76 (33%)	11 (5%)

TABLE 8

INDIVIDUAL STUDENT PROGRESS

STUDENT	SEX	GRADE	AGE	VISION IMPAIR-MENT	TYPE OF PROGRAM	NO. OF PRETESTS GIVEN	NO. OF PRETESTS MASTERED	COMMENTS
A	F	TMR[1]	11	LV[2]	Itinerant	20	14	Completed program.
B	F	PreK[3]	5	LV	Self-Contained Classroom	6	0	Went through Unit III. Teacher Comments: Student has problems remembering, perseverates. Score of 83 on the MB*.
C	M	EMR[4]	10	LV	Itinerant	11	8	Began with Unit V at decision of teacher. Went through Unit X-1.
D	M	PreK	5	LV	Self-Contained Classroom	13	12	Went through Unit VII-1. Teacher Comment: Absent a lot.
E	F	PreK	4.5	Blind[5]	Itinerant	12	11	Went through Unit VI-1. Teacher Comment: Lesson V-1 was too hard for this child; didn't understand story for Units V and VI.
F	M	1	7	Blind	Resource Room	20	13	Completed Program. Teacher Comment: High interest in lessons on part of student; student already doing braille.
G	F	PreK	4	LV	Itinerant	20	19	Completed Program.
H	F	PreK	4	LV	Self-Contained Classroom	20	17	Completed Program. Score of 119 on MB*.

*Maxfield-Bucholz Scale of Social Maturity

TABLE

STUDENT	SEX	GRADE	AGE	VISION IMPAIR-MENT	TYPE OF PROGRAM	NO. PRE G
I	F	K	5	LV	Itinerant	
J	F	Non-Graded	8	LV	Self-Contained Classroom	
K	F	PreK	4	LV	Itinerant	
L	F	Non-Graded	6	LV	Itinerant	
M	F	PreK	3	LV	Itinerant	
N	M	K	5	LV	Itinerant	
O	M	K	6	LV	Self-Contained Classroom	
P	F	K	5	LV	Itinerant	
[illegible]	M	PreK	5	LV	Itinerant	
R	F	PreK	4	LV	Itinerant	

8 (continued)

OF ESTS VEN	NO. OF PRETESTS MASTERED	COMMENTS
.8	15	Went through Unit IX.
.2	9	Went through Unit VI. WISC verbal score of 72. Student has cerebral palsy.
20	18	Completed program. Has mild cerebral palsy. Teacher comment: Some reasoning questions were too difficult for age level.
20	18	Completed program. Teacher comment: Student has emotional problems.
20	17	Completed program.
20	18	Completed program. Has paralysis on left side.
.6	8	Went through Unit VIII. Has anemia.
.6	14	Went through Unit VIII.
20	19	Completed program. Teacher comment: Very bright; easily bored with lessons.
8	0	Went through Unit IV. Teacher comment: Child is culturally deprived; has poor language development.

TABLE 8

STUDENT	SEX	GRADE	AGE	VISION IMPAIR-MENT	TYPE OF PROGRAM	NO. PRET GI
S	M	K	6	LV	Itinerant	2
T	M	K	5	LV	Itinerant	

[1]Trainable Mentally Retarded
[2]Low Vision
[3]Preschool
[4]Educable Mentally Retarded
[5]Totally Blind or Near Blind

(continued)

OF ESTS VEN	NO. OF PRETESTS MASTERED	COMMENTS
0	7	Completed program. Has possible neurological handicap.
6	4	Went through Unit III. Teacher comment: Possibly mentally retarded, speech impaired, very unattentive most of the time.

supplied indicate that on the average the time needed to teach each lesson was well within the goal of approximately one hour, although there were wide variations for individual children. The lessons were designed so that teachers would not have to do pre-planning, but teachers were required to assemble the materials used in the learning exercises. This time, too, appeared to be within reasonable limits for most of the lessons. The ranges and means for the time spent in preparing and teaching each lesson are shown in Table 9.

B. Teacher Interview Data

A series of individual interviews was conducted with teachers near the end of the school year to obtain their reactions to the PREP. All teachers were asked the same questions but were free to respond in an open-ended way. Their responses have been categorized under a number of general topic areas.

Strengths of the Program

A total of 37 specific strengths of the program were mentioned by the 11 teachers who were interviewed, in response to the question: "What do you think are the major strengths of the PREP in terms of student learning and usefulness to you in instruction?" The characteristics most frequently cited are shown in Table 10. Other strengths singled out by individual teachers included the use of meaningful materials, the appropriateness of the materials for students with different handicaps and at different developmental levels, and various aspects of the stories.

The three comments tallied in Table 10 about the choice and comprehensiveness of the concepts in the PREP were volunteered. Later in the interview, all teachers were specifically asked if they considered the concepts in the PREP to be appropriate. Each of the 11 teachers answered in the affirmative. None of the teachers would delete any of the concepts taught, although five teachers recommended that the program be expanded to include additional concepts. On the basis of these comments, it would appear that another major strength of the program is its basic content.

TABLE 9

TIME REQUIREMENTS FOR TEACHER PREPARATION AND INSTRUCTION

Unit/ Lesson	Instruction Time (In Minutes)			Teacher Prep Time (In Minutes)		
	N*	Range	Median	N*	Range	Median
I-1	12	5-90	30	13	5-50	15
I-2	8	10-40	20	8	5-90	10
II-1	10	5-60	30	10	0-90	30
II-2	9	5-135	60	9	0-40	20
III-1	5	15-55	30	6	10-45	20
III-2	6	5-30	10	7	0-15	10
IV-1	4	10-30	20	3	10-45	10
IV-2	3	26-45	40	2	7-10	9
V-1	6	15-105	45	8	10-30	15
V-2	2	10-25	18	1	25	25
VI-1	--	--	--	--	--	--
VI-2	1	50	50	1	20	20
VII-1	7	20-60	40	7	0-15	10
VII-2	2	20-30	25	2	20-20	20
VIII-1	8	10-80	30	9	10-40	25
VIII-2	3	20-50	20	2	9-10	10
IX-1	2	15-55	35	3	20-90	20
IX-2	5	30-75	40	6	5-90	15
X-1	2	25-30	28	2	20-20	20
X-2	4	10-40	25	4	5-60	20

*Number of entries on progress logs.

TABLE 10

STRENGTHS OF THE PREP

Strength	Number of Teachers Mentioning
Organization/progression of lessons	7
Simplicity and ease of use	4
Interest and motivation for students	4
Ideas (good/specific)	4
Choice/comprehensiveness of concepts	3
Use of repetition and reinforcement	3
Use of experiential learning exercises	3
"Students learn"	3

Weaknesses of the Program

In keeping with the developmental goals of the project, a number of probing questions were asked to identify specific areas where improvements in the program would be desirable. Despite the fact that teachers' attention was directed more toward the identification of weaknesses than strengths, there were fewer negative than positive comments. Areas of needed improvement are summarized in Table 11.

Teachers were most dissatisfied with the number of materials required and the difficulty of assembling, keeping, or transporting them. This was especially true for itinerant teachers. Despite these comments, a large majority of the teachers felt that the preparation time required for teaching the lessons and the cost of the materials were reasonable. For example, nine of the teachers spent less than $5 in acquiring the needed supplies. Those teachers who followed the suggestion in the Teachers Guide that substitutions could be made were least critical of the materials requirements. Several teachers expressed an understanding of the need for variety, as well as an appreciation of the advantage to the child in being exposed to commonly-used articles. It was clear, however, that most teachers would prefer to have a pre-assembled kit with the program.

TABLE 11

WEAKNESSES OF THE PREP

Weakness	Number of Teachers Mentioning
Difficulties of assembling, keeping, and transporting materials	7
Difficulty level of pretests	6
Number of materials required	5
Difficulty level of stories/questions	4
Organization/progression of lessons	3

Six teachers thought that the pretests were too easy or too short. The stories, on the other hand, were considered by four teachers to be too advanced or the questions to be inappropriate for the developmental level of a particular child. Although three teachers felt that the organization or progression of the lessons could be improved, seven of the teachers considered the program's structure one of its strengths.

Three miscellaneous weaknesses were mentioned by individual teachers. One itinerant teacher felt that the lessons were too difficult to administer because of her limited time with students and because of the limited teaching space provided for her. Two of the teachers made comments about weaknesses in the program which were appropriate within the context of the field test, but which were not directly relevant to the program's purpose as a tool for children who have not yet started their reading instruction. Thus, one teacher commented that the program was too elementary for a child with prior schooling, and one teacher felt that the program took the child away from other school work which was more important.

Appropriateness of Instructional Level

Teachers were asked their estimate of the most appropriate age or developmental level at which the PREP should be used with students. Ten of the 11 teachers felt that the program would be appropriate at the pre-kindergarten level for most children. One teacher felt that kindergarten was an appropriate level. Most of the teachers would also use the program with older children, depending on their developmental levels.

When asked if they thought the PREP would be useful for normally sighted children, all 11 of the teachers answered "yes." Their reasons primarily focused on the importance of the concepts and the usefulness of the stories for developing students' thought processes. Sighted children with whom they would use the program included "the very young," "slow learners," and "preschool or kindergarten children not getting the basics."

One interview question was, "Do you think the PREP is appropriate for children with handicaps other than visual; if so, which groups?" All of the teachers felt that the program was appropriate for other handicapped children. Specific handicapping conditions which they considered in relation to the PREP are shown in Table 12.

Five of the teachers thought the program could be used without modification with the educable mentally retarded and trainable mentally retarded (in fact, a small number of children who successfully used the program in the study fell within these categories). Again, four teachers felt the program was useful for any child at the appropriate developmental level, including the handicapped. There was a difference of opinion concerning use of the PREP with deaf or orthopedically handicapped children. Two of the teachers felt that the materials could not be manipulated by children who were physically handicapped, although three teachers thought that the program could be modified to accommodate these differences. The one teacher who felt that the program would be useful with deaf children suggested that instruction could be carried out with signs.

TABLE 12

APPROPRIATENESS OF PREP FOR CHILDREN WITH OTHER HANDICAPS

Handicapping Condition	Number of Teachers Responding		
	Appropriate As Is	Appropriate With Modifications	Not Appropriate
EMR/TMR	5	1	1
Any Handicapped Child	4		
Learning Disabled	2		
Educationally Handicapped	1		
Cerebral Palsy	1		
Orthopedically Handicapped		3	2
Deaf or Deaf/Blind		1	2

Time Requirements

Teachers were free to develop their own plans for coordinating PREP instruction with their other assignments, and there was wide variability in the scheduling of the lessons. Most teachers tried to complete one teaching/learning objective or one lesson at a time. These times ranged from once a day to once a week, with most sessions lasting from 15 to 20 minutes. Because the PREP instruction was an adjunct to their regular workloads, it proved difficult for several of the teachers to keep a consistent schedule. Itinerant teachers, especially, found it hard to complete the program because of the brief time they had to spend with students. Another obstacle to the progress of the lessons was the large number of student absences during the winter. Many of these problems would have been alleviated if the PREP had been part of the regular curriculum and planned into children's instructional programs at the beginning of the school year.

Teachers were asked to estimate how much time a teacher should plan to go through the entire program from start to finish. Typically, they felt this question was difficult if not impossible to answer since progress "depends on the child." Four teachers felt the program might be completed in half a school year or less with regular scheduling. On the other hand,

three teachers estimated that it might require as much as two years to complete the program, taking into account the child's ability and the other instructional tasks to be done. Again, it was difficult to obtain good estimates of time requirements since the PREP was not part of the basic curriculum.

Use of the Program by Aides and Others

One measure of the flexibility of an instructional program is its usefulness by instructional aides or other persons without professional teacher training. It appears that the PREP does have this flexibility, since all 11 teachers responded that the program could be used by persons other than the regular classroom teachers or teachers with specialized training in the education of the visually handicapped. In fact, four of the teachers in the field test did ask someone else to administer some of the lessons, including two student teachers, a mobility instructor, a parent, and fifth and sixth grade student tutors supervised by an aide.

Parent Involvement

An integral part of the program's design was the involvement of parents through the provision of storybooks which the children could take home and share with their parents. Unfortunately, only six of the teachers allowed or encouraged their students to do this. Two of the five teachers who did not send books home thought it was a good idea but it had not occurred to them, even though this point had been emphasized in the Teachers' Guide and during the first site visit. Other reasons for not involving the parents in this way were that the teacher stopped sending the books after one had been taken home and was not returned, and one mother objected to the braille on the grounds that her child was low vision and not blind.

Various positive comments were made by teachers of students who did take books home, including the following:

- The mother and father read to the child and the child related the story in his own words.
- One parent, a print reader, was intrigued by the braille.
- The books opened up a discussion about the child's vision problem.
- A blind parent could read to the child and vice versa.

One child wanted to take three books home every night, but was limited to two by the teacher. It was apparent from the teachers' comments that the storybooks were an effective means of stimulating an interest in reading on the part of the children and an interest in the instructional program on the part of many parents.

Only two of the teachers involved parents in any other way in the try-out of the PREP, and these efforts were limited mainly to explaining the program to the parents and keeping them informed of the child's progress. One teacher did give copies of the Experiential Exercises to a parent for the purpose of helping the child at home.

Use of the Story Questions

Two sets of questions accompanied each of the stories. One set was designed to help the child in summarizing the content of the story, and the other set was designed to stimulate the child's reasoning skills by applying the content of the story to his or her own experiences and feelings. All of the teachers used at least some of the questions as aids to reading comprehension. By and large, teachers liked the questions although they were sometimes thought to be too difficult for the age or developmental level of a particular child. Some of the comments indicated that the teachers did not feel free to select from among the questions or to rephrase the harder ones in more appropriate terms for the child. The Teachers' Guide was subsequently revised to encourage this type of flexibility.

Teachers' positive comments about the questions generally were related to their instructional purposes: "They were challenging and made the children think;" "they emphasized vocabulary;" "they were important for regular reading classes;" "they emphasized auditory comprehension;" "they encouraged the child to verbalize." Teachers' negative comments about the questions were more often related to their content: "They were too complex or hard;" "they were too "heavy" for the child's feelings;" "there were too many."

Teachers' Overall Evaluation of the PREP

At the conclusion of the interviews, teachers were asked a series of summary questions about their general reactions to the PREP. These questions and the teacher responses are shown in Table 13.

TABLE 13

TEACHERS' OVERALL EVALUATION OF THE PREP

	Yes	No	Depends On the Child
Do you think that the time your student(s) spent working on the PREP was worthwhile?	9	0	2
In your opinion, is the PREP a viable reading readiness tool for teaching concepts?	9	0	2
Would you recommend the PREP to others?	9	0	2

When asked why they felt the program was worthwhile, four of the teachers commented that they considered the concepts to be necessary for the child's development. Another teacher said that the concepts were directly related to the learning of reading and math. Other specific comments were that the lessons provided good feedback to the teacher, that the children enjoyed the experience, and that parents could easily see the child's progress.

Teacher comments about the viability of the PREP as a reading readiness tool ranged from the qualified (three teachers said, "Yes, but not used alone") to the enthusiastic: "The whole thing's fantastic;" "I wish I'd had this two years ago; I've been racking my own brain to develop a teaching method." Other specific comments were that the program was viable for low ability students and that it was inexpensive, easy to do and follow, and worthwhile.

When asked if they would recommend the program to others, nine said "yes," including two teachers who replied that they already had done so. In one case, a teacher outside the study had used the program to test the developmental stage of a pre-reading child. In the second case, one of the PREP teachers had organized a meeting with other teachers in the school to discuss the program. Those teachers who would recommend the program "depending on the child" indicated that it was good for the totally blind, the mentally retarded, and children who need help, but that it would not be appropriate for brighter children. Specific comments of teachers who responded

in the affirmative were that they would recommend the program for both normal and handicapped children in early childhood education; the severely handicapped; the retarded; children with visual perception problems; and children needing remedial help. One teacher remarked that "teachers of the learning handicapped would jump at the chance to use this program." Another teacher thought the program was especially good for visually handicapped children at the pre-kindergarten level and young educable and trainable mentally retarded children.

A final interview question concerned any additional benefits which the teachers thought that students had received from the program, in addition to its major goal of concept development. Responses to this question are categorized in Table 14. There was considerable diversity in the number

TABLE 14

OTHER STUDENT BENEFITS FROM THE PREP

Benefit	Number of Teachers Mentioning
Improved listening skills	4
Improved social skills (eating, sharing, interacting with teachers and tutors)	3
Language development	3
Emotional (identification with stories, learning success, attention of parents)	3
Improved learning skills (learning to take tests, to work in a structured way, to follow directions)	3
Improved thinking skills	2
Physical development	1
Increased interest in environment	1
Stimulated imagination	1

of developmental areas affected by the PREP, including social, emotional, educational, and cognitive skills, as well as physical development and increased awareness of the environment. These benefits undoubtedly reflect the multisensory and experiential activities that were an essential part of the program.

IV. CONCLUSIONS

The results of the field test of the Preparatory Reading Program indicate that the lessons are a viable reading readiness tool for visually handicapped children in terms of student and teacher time, direct costs, ease of use, appropriateness of the concepts taught, and student interest in the materials. Strengths of the program, according to teachers, are its ease of use, high interest level, and choice of concepts. Teachers considered the major weakness of the program to be the requirement that they collect a large number of concrete objects for use with the lessons. Some teachers also noted that the pretests did not appear to be valid measures of a child's conceptual understanding. Subsequently, the pretests were lengthened to improve their reliability.

It was the consensus of teachers that visually handicapped children who are developmentally at a reading readiness level can benefit from the program. In addition, visually handicapped children who are already reading can benefit from the program when it is used as a means of remediation for teaching concepts that have not been learned. It is likely that children other than those with severe vision deficits can also profit from exposure to the Preparatory Reading Program, including non-handicapped preschool children, disadvantaged kindergarten children, and children with learning problems related to learning disability or mental retardation.

Instructional time for the program varies with the needs of each child. However, it is reasonable to expect that the entire program can be completed during one school year with children of about average intelligence who are at a prereading level. The program can be used by regular teachers of mainstreamed students and by classroom aides because of the step-by-step instructions included in the manual. It is also possible to involve parents in their children's learning activities through the use of Experiential Exercises and stories at home.

Teacher comments indicated that the program's experiential and multisensory approach has a number of benefits for children in addition to concept development. These benefits include improved social, educational, and cognitive skills, and increased awareness of their own bodies and the environment. Teachers were generally enthusiastic about the program and would recommend it to others.

V. RECOMMENDATIONS

The immediate goal of this project has been to produce an empirically-developed instructional package to improve early education for visually handicapped children and to demonstrate that this product effectively meets an existing need. The results of the field test indicate that this goal has been met, and a major recommendation is that the materials be published and made available to special education teachers across the country. It is also recommended that the usefulness of the program be enhanced by the development of an optional kit of objects to accompany the printed lesson plans. Such a kit would reduce the time required by teachers to prepare for the lessons, but would not supplant the use of commonly-available materials by those teachers who choose not to purchase the kit.

Three recommendations are made for further research related to concept development in visually handicapped children:

- There is little concrete evidence about the developmental stages of concept acquisition in visually handicapped children; it is recommended that empirical research be conducted to determine if there is a general sequence in which this occurs, as a basis for improved instruction of such children.
- The Preparatory Reading Program was necessarily limited to a small number of concepts, and it is apparent that many additional concepts must be mastered for the child's early success in school; it is recommended that the program be expanded to cover additional concepts and higher grade levels.
- Reading is only one of the basic skills that must be acquired by children during their primary school years; it is recommended that a program patterned after the Preparatory Reading Program be developed to teach basic math concepts to the visually handicapped and other children who might benefit from such a program.

V. REFERENCES

Goldish, L. H. The severely visually impaired population as a market for sensory aids and services, (Part I.). The New Outlook for the Blind, June 1972, 66, 183-190.

Nolan, C. Y., & Kederis, C. J. Perceptual factors in braille word recognition. New York: American Foundation for the Blind, Research Series No. 20, 1969.

VII. APPENDIXES

APPENDIX A

READINESS PROGRAMS

Beginning to Read, Write and Listen Readiness Kit
J. B. Lippincott
Educational Publishing Division
E. Washington Square
Philadelphia, Pennsylvania 19105
1974

Distar Language I
Science Research Associates, Inc.
259 East Erie St.
Chicago, Illinois 60611
1969

Early Childhood Curriculum -- A Piaget Program
American Science & Engineering, Inc.
20 Overland St.
Boston, Massachusetts 02215
1973

Frostig Program for the Development of Visual Perception
Follett Publishing Company
1010 W. Washington Blvd.
Chicago, Illinois 60607
1964, 1968

Growing with Language: Laying Foundations for Reading. Kindergarten
Mary Jane Reed
Bloomington Public Schools
Bloomington, Minnesota 55420
1968

Instructional Concepts Program
Southwest Regional Laboratory for Educational Research & Development
Ginn & Company
Lexington, Massachusetts 02173
1972

The Language and Thinking Program
CEMREL, Inc.
Follett Publishing Company
1010 West Washington Blvd.
Chicago, Illinois 60607
1973

Peabody Language Development Kit -- Level #1
American Guidance Service
Circle Pines, Minnesota 55014
1966

Pre-School Program for Low Vision Children
Campus School
Boston College
Boston, Massachusetts 02167
(from: Hull, Wilma, and McCarthy, Daniel G., Supplementary program for pre-school visually handicapped children. Utilization of vision/increased readiness. Education of the visually handicapped, 1973. V(4), pp. 97-104.)

Readiness in the Language Arts
The Sullivan Reading Program
Behavioral Research Laboratories, Inc.
Ladera Professional Center
Menlo Park, California 94025
1967

APPENDIX B

CONCEPTS TAUGHT IN THE PREP

UNIT	DESCRIPTION
1. SENSORY MATCHING	The student will be able to determine a corresponding or suitably associated pair: sound-object match sound-action match
2. SIZE	The student will be able to identify the spatial dimensions, proportions, or extent of an object in relation to other objects: big, little long, short
3. SHAPE	The student will be able to identify geometric shapes by their outline: square circle
4. ACTION	The student will be able to perform a directed activity: start, stop slow, fast
5. POSITIONS I	The student will be able to recognize the location or place of an object at a given moment in relation to another object: top, bottom left, right
6. POSITIONS II	The student will be able to recognize the location or place of an object at a given moment in relation to another object: up, down over, under

CONCEPTS TAUGHT IN THE PREP (continued)

UNIT	DESCRIPTION
7. RELATIONSHIPS	The student will be able to relate parts of objects to the object as a whole and recognize the relationship between objects that belong together: same, different parts, whole
8. TIME	The student will be able to recognize the system of sequential relation that any event has to another: first, last before, after
9. CONFIGURATIONS	The student will be able to order objects by a prescribed rule: patterning sequencing
10. CLASSIFICATION	The student will be able to sort objects into categories that are perceptually apparent and be able to arrange objects into groups according to some definite plan: sorting into given categories selecting categories for grouping

APPENDIX C

CONCEPTUAL AREAS AND INSTRUCTIONAL OBJECTIVES FOR THE PREP

CONCEPTUAL AREAS AND INSTRUCTIONAL OBJECTIVES FOR THE PREP

UNIT 1: SENSORY MATCHING

The student will be able to determine a corresponding or suitably associated pair.

Lesson 1: SOUND-OBJECT

- GP 1: *The child will be able to match a common object with its sound.*
- GP 2: *The child will be able to match an object with its sound by selecting the object from a group of objects and manipulating the object to produce the sound.*
- GP 3: *The child will be able to match an object with its sound by naming the object when presented with its sound.*

Lesson 2: SOUND-ACTION

- GP 1: *The child will be able to match a body action with its sound by performing the specific body movement that produces the sound.*
- GP 2: *The child will be able to match an action of an object with its associated sound.*
- GP 3: *The child will be able to match an action with its sound by naming the action when presented only with its sound.*

UNIT 2: SIZE

The student will be able to identify the spatial dimensions, proportions, or extent of an object in relation to other objects.

Lesson 1: BIG-LITTLE

- GP 1: *The child will be able to select the big or little object from a pair of objects that are clearly different in size.*
- GP 2: *The child will be able to select the big or little object from a group of objects that are clearly different in size as well as other characteristics.*
- GP 3: *The student will be able to select a big or little object from a pair of objects that are named by the teacher.*

Lesson 2: LONG-SHORT

- GP 1: *The child will be able to select the short or long object from a pair of objects that are clearly different in length.*
- GP 2: *The child will be able to select the short or long object from a group of objects that are clearly different in length as well as other characteristics.*
- GP 3: *The child will be able to select a long or short object from a pair of objects that are named by the teacher.*

UNIT 3: SHAPE

The student will be able to identify geometric shapes by their outline.

Lesson 1: SQUARE

- GP 1: *The child will be able to select a square from a pair of shapes that are different.*
- GP 2: *The child will be able to select squares of different sizes, colors, and textures from a group of objects.*
- GP 3: *The child will be able to select the object that is square from a pair of objects named by the teacher.*

Lesson 2: CIRCLE

- GP 1: *The child will be able to select a circle from a pair of shapes that are different.*
- GP 2: *The child will be able to select circles of different sizes, colors, and textures from a group of objects.*
- GP 3: *The child will be able to select the object that is circular from a pair of objects named by the teacher.*

UNIT 4: ACTION

The student will be able to perform a directed activity.

Lesson 1: START-STOP

- GP 1: *The child will be able to start and stop specified body movements as directed by the teacher.*
- GP 2: *The child will be able to start and stop activities involving the manipulation of objects as directed by the teacher.*
- GP 3: *The child will be able to indicate when an activity performed by another person or object has started or stopped.*

Lesson 2: SLOW-FAST

- GP 1: *The child will be able to perform specified slow and fast body movements as directed by the teacher.*
- GP 2: *The child will be able to perform activities involving the manipulation of objects slowly and fast as directed by the teacher.*
- GP 3: *The child will be able to indicate whether an activity performed by another person or object is slow or fast.*

UNIT 5: POSITIONS I

The student will be able to recognize the location or place of an object at a given moment in relation to another object.

Lesson 1: TOP-BOTTOM

- GP 1: *The child will be able to identify the top and bottom parts of his or her body.*
- GP 2: *The child will be able to correctly identify the top and bottom parts of objects on a vertical plane.*
- GP 3: *The child will be able to identify objects which occupy a top or bottom position in relationship to other objects.*

Lesson 2: LEFT-RIGHT

- GP 1: *The child will be able to select those parts of his or her body which are on the left side, and those which are on the right side.*
- GP 2: *The child will be able to select the object on the left and the object on the right from pairs or groups of objects.*
- GP 3: *The child will be able to move objects to the left and to the right from a central location.*

UNIT 6: POSITIONS II

The student will be able to recognize the location or place of an object at a given moment in relation to another object.

Lesson 1: UP-DOWN

- GP 1: *The child will be able to perform up and down body movements as directed by the teacher.*
- GP 2: *The child will be able to move objects up and down as specified by the teacher.*
- GP 3: *The child will be able to determine whether an external object is in an up or down position.*

Lesson 2: OVER-UNDER

- GP 1: *The child will be able to position his or her body over or under a reference point specified by the teacher.*
- GP 2: *The child will be able to position objects over or under a reference point specified by the teacher.*
- GP 3: *The child will be able to indicate whether an object is over or under a reference point specified by the teacher.*

UNIT 7: RELATIONSHIPS

The student will be able to relate parts of objects to the object as a whole and recognize the relationship between objects that belong together.

Lesson 1: SAME-DIFFERENT

- GP 1: *The child will be able to select, from a group of objects, one object that is the same as, or different from an object presented by the teacher.*
- GP 2: *The child will be able to state whether specific pairs of objects are the same or different.*
- GP 3: *The child will be able to select the same or different objects from a group of objects presented by the teacher.*

Lesson 2: PART-WHOLE

- GP 1: *The child will be able to recognize relationships between his or her body and its parts.*
- GP 2: *The child will be able to recognize relationships between objects and their parts.*
- GP 3: *The child will be able to recognize that a part is missing from an object presented by the teacher.*

UNIT 8: TIME

The student will be able to recognize that sequential relationships exist between events.

Lesson 1: FIRST-LAST

- GP 1: *The child will be able to indicate when a given action or sound occurs first in a series of two events.*
- GP 2: *The child will be able to indicate when a given action or sound occurs last in a series of two events.*
- GP 3: *The child will be able to indicate when a given action or sound occurs first or last in a series of three or more events.*

Lesson 2: BEFORE-AFTER

- GP 1: *The child will be able to state whether one of two simple, sequential events occurred before or after the other.*
- GP 2: *The child will be able to perform activities named by the teacher in a designated before/after sequence.*
- GP 3: *The child will be able to name familiar daily events which occur before or after a given reference point in time.*

UNIT 9: CONFIGURATIONS

The student will be able to order objects by a prescribed rule.

Lesson 1: PATTERNING

- GP 1: *The child will be able to recognize tactual patterns.*
- GP 2: *The child will be able to match identical tactual patterns in a group of patterns presented by the teacher.*
- GP 3: *The child will be able to recognize a specific tactual pattern from its name.*

Lesson 2: SEQUENCING

- GP 1: *The child will be able to replicate a given sequence of objects.*
- GP 2: *The child will be able to replicate a given sequence of sounds.*
- GP 3: *The child will be able to describe a given sequence of events.*

UNIT 10: CLASSIFICATION

The student will be able to sort objects into categories that are perceptually apparent and be able to arrange objects into groups according to some definite plan.

Lesson 1: SORTING INTO CATEGORIES

- GP 1: *The child will be able to sort sets of objects into given categories that are named by the teacher.*
- GP 2: *The child will be able to sort sets of objects into given categories according to the general physical properties of the objects.*
- GP 3: *The child will be able to sort sets of objects into given categories according to the function of the objects.*

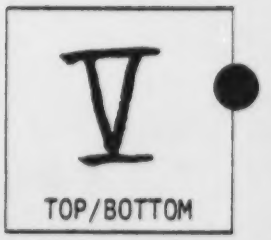
Lesson 2: SELECTING CATEGORIES

- GP 1: *The child will be able to select categories for grouping two discrete sets of objects so that each set contains objects that are exactly alike.*
- GP 2: *The child will be able to select categories for grouping two sets of objects which are dissimilar in some characteristics but which have one obvious physical property in common.*
- GP 3: *The child will be able to select categories for grouping two sets of objects according to the function they have in common.*

APPENDIX D

LESSON FORMAT

Guided Presentation 3



OBJECTIVE: The child will be able to identify objects which occupy a top or bottom position in relationship to other objects.

PURPOSE: These exercises are designed to help the child expand his or her understanding of top and bottom as parts of objects to an understanding of top and bottom as relative positions in space. It requires the child to move from concrete experiences to more abstract thinking.

MATERIALS:

Exercise A

a 12-inch ruler with a strip of sandpaper taped or stapled to one end

Exercise B

an unopened box of tissues

two rolls of toilet paper

Exercise C

six books and a bookcase
(Books should be in braille or large print as appropriate.)

G.P.3
Exercise B

V
TOP/BOTTOM

Stack the three objects in the various configurations. Guide the child's hand to the objects as you talk.

"Here are some things that are fun to build with. I can put the box of tissues on the bottom and the two rolls of toilet paper on top."

an unopened box of tissues
two rolls of toilet paper

"I can put the toilet paper on the bottom and the box of tissues on the top."

"I can put one roll of toilet paper on the bottom, then the box of tissues, and then the other roll of toilet paper on top."

Let the child stack the objects in any order. Help the child stack the objects and identify top and bottom objects if necessary.

"Now it's your turn to build something." (Wait for response.) "Tell me what you have on the bottom." (Wait for response.)

"What is on top?" (Wait for response.)

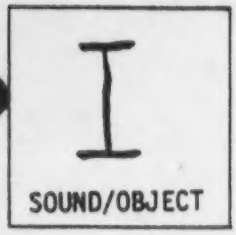
"Now build something else." (Wait for response.) "What did you put on the bottom?" (Wait for response.)

"What is on top?" (Wait for response.)

Continue the exercise, asking the child to identify the top and bottom objects in three more stacks he or she builds. Help the child restack the objects and identify the top and bottom positions if necessary.

APPENDIX E

SAMPLE PRETEST ITEMS



Pretest

Materials

an alarm clock with a distinctive ticking sound
a paper lunch bag
a small bowl of marbles
two jars half-filled with rice
two pieces of aluminum foil (about 1 square foot)
two sets of keys
a drum and a drumstick
a whistle

Test

1a. Let the child examine the clock.

SAY: "Do you know what thing makes this sound?"

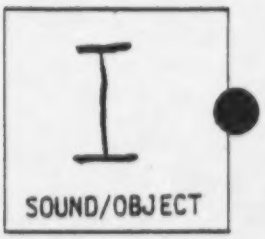
b. Let the child examine the paper bag. Then rustle the bag.

SAY: "Do you know what thing makes this sound?"

c. Let the child examine the bowl of marbles. Then stir the marbles.

SAY: "Do you know what things make this sound?"

24



If all three items are answered correctly, go on to Question 2.

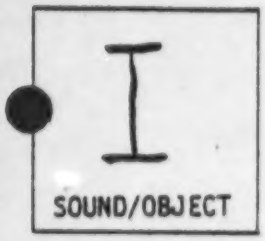
If one or more items are answered incorrectly, the child should concentrate on the SOUND-OBJECT MATCH Experiential Exercises and begin with Guided Presentation 1.

2. Let the child examine a jar with rice, a piece of aluminum foil, and a set of keys. Prepare to manipulate an identical set of items out of the child's view.

a. SAY: "Listen carefully and don't turn around. Can you make the sound that I'm making?" (Shake the jar with rice in it.)

b. SAY: "Listen carefully and don't turn around. Can you make the sound that I'm making?" (Rustle the aluminum foil.)

c. SAY: "Listen carefully and don't turn around. Can you make the sound that I'm making?" (Shake the set of keys.)



Pretest

If all three items are answered correctly, go on to Question 3.

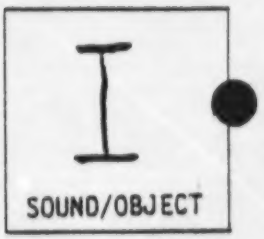
If one or more items are answered incorrectly, the child should begin with Guided Presentation 2.

3. Prepare to beat the drum, turn on the alarm of the clock, and blow the whistle out of the child's view.

a. SAY: "Listen carefully and don't turn around. What thing is making this sound?" (Beat the drum several times. Wait for response.)

b. SAY: "Listen carefully and don't turn around. What thing is making this sound?" (Turn on the alarm of the clock. Wait for response.)

c. SAY: "Listen carefully and don't turn around. What thing is making this sound?" (Blow the whistle several times. Wait for response.)



If all three items are answered correctly, the child can go on to the next set of concepts.

If one or more items are answered incorrectly, the child should begin with Guided Presentation 3.

APPENDIX F

DATA COLLECTION INSTRUMENTS

STUDENT DATA CHECKLIST

Student's name_____ Birthdate_____ Sex_____

Grade Level_____

Prior Schooling: Preschool___ Kindergarten___ 1st___ 2nd___ 3rd___
repeat: ___ ___ ___ ___ ___

Visual Impairment: totally or near blind ___ low vision ___

Diagnosis of vision handicap:_____

Distance visual acuity (w/ correction): left eye ___ right eye ___

Age of onset of vision handicap:_____

Potential reading mode: braille ___ large print ___

Other handicaps:

WISC score, if available: _____ Date_____

Instructional program: Residential _____
Public, itinerant teacher _____
Public, resource room _____
Public, self-contained _____

Has child been read to at home? Yes No

Number of siblings: Older___ Younger___

Number of family members who are visually handicapped: Parents_____
Siblings_____

PROGRESS LOG

Unit # _____ Student's Name _____

Lesson # _____ Teacher's Name _____

Entry level: G.P. 1 ____ G.P. 2 ____ G.P. 3 ____ Mastery ____

	Instruction Time	Teacher Prep. Time	G.P. Passed On First Attempt (check one)	G.P. Required Review (check one)
G.P.1	_____ min.	_____ min.	_____	_____
G.P.2	_____ min.	_____ min.	_____	_____
G.P.3	_____ min.	_____ min.	_____	_____

TEACHER EVALUATION OF

Materials	Too Hard	Too Easy	About Right
Lesson:			
Objectives	○	○	○
Exercises	○	○	○
Length	○	○	○
Vocabulary	○	○	○
Story:			
Content	○	○	○
Raised line drawings	○	○	○
Questions	○	○	○

Student Response	Excell.	Avg.	Poor
Interest level (G.P.)	○	○	○
Interest level (story)	○	○	○
Mastery of unit	○	○	○

Anecdotal remarks, suggestions for improvement: _____

_____

_____

_____

Name_____ Date_____

Interview Guide

1. What do you think are the major strengths of the PREP in terms of (a) student learning and (b) usefulness to you in instruction?

2. What do you think are the major weaknesses of the PREP?

3. What changes would you make in the PREP?

4. For what age or developmental levels do you think the PREP is most appropriate?

5. Do you think the PREP would be useful for normally sighted children? In what way or for which group?

6. Do you think the PREP is appropriate for children with handicaps other than visual? (Specify which groups – e.g., physically handicapped, learning disabled, environmentally disadvantaged, etc.)

7. Do you think the PREP is equally beneficial for potential print readers and potential braille readers?

8. What did you find was the best time management plan for teaching the PREP? (one GP per day, more than one GP per day, one GP every other day equalling one lesson per week, one lesson every two weeks, other)

9. How much time should a teacher plan to teach the entire program from start to finish?

10. When is it best to use the PREP — before formal reading instruction begins or concurrently with formal reading instruction? Why?

11. Which, if any, of your students involved in the PREP tryouts is receiving formal reading instruction?

12. Has the PREP helped these students (this student) in learning to read? In what way?

13. Do you feel the pretests were an accurate indication of the child's knowledge of the concept being tested? Why or why not?

14. Was the amount of time needed to prepare each lesson in the PREP reasonable? (about right, too much, a lot but worth it)

15. Did you have any difficulty finding some of the materials? Which ones? What substitutes did you make, if any?

16. About how much money did you spend to purchase those items that you did not have at home or in the school? (less then $5, $5-$10, $10-$15, over $15)

17. Was your school district able to cover the cost of the materials you purchased?

18. Were the concepts in the PREP appropriate? Which ones would you add? Which ones would you drop?

19. Did your children take the storybooks home? Explain?

20. Were the parents involved in any other ways in the program? Explain.

21. Did any other people teach PREP lessons to your children? (parents, adult classroom aids, other students, other teachers, other)

22. If other people taught PREP lessons to your children, were they able to use the lessons effectively? Why?

23. Did you use the summary questions at the end of each story? What did you like or dislike about the questions?

24. Did you use the reasoning questions at the end of each story? What did you like or dislike about them?

25. Did PREP instruction take time away from other instructional pursuits of your student(s)? Which pursuits?

26. Do you think that the time your student(s) spent working on the PREP was worthwhile? Why?

27. Were there any benefits that your student(s) got from the PREP other than learning specific concepts? (language improvement, experiences, introduction to braille, interest in environment, positive learning experience, self-confidence, other)

28. In your opinion, is the PREP a viable reading-readiness tool for teaching concepts (in terms of the time and money required and its effectiveness by comparision with alternative methods). Explain.

29. Would you recommend the PREP to others? If yes, under what conditions?